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EXAMINER

WEINSTEIN, LEONARD J

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                       |  |
|------------------------------|--------------------------------------|---------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/592,978 | <b>Applicant(s)</b><br>BRANDES ET AL. |  |
|                              | <b>Examiner</b><br>LEONARD WEINSTEIN | <b>Art Unit</b><br>3746               |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/23/2010</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

2. The instant specification does not comply with 37 CFR 1.77(b) because not headings are included.

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are:

- a. Unclear due to length of sentences – Example pg. 6 the disclosure of:

Accordingly, the regulating valve 10 comprises a cylinder space 11, which has, on the one hand, a fluid connection, by way of a line 12, with the

Art Unit: 3746

drive mechanism chamber of an axial piston compressor and, on the other hand, a fluid connection, by way of a further line 13, with the suction side of the compressor and within which a piston 14, closed on the low-pressure side, is mounted so as to be displaceable back and forth in each case against the action of a resilient element--in this instance helical compression springs 15, 16--and of the forces caused by the inlet and outlet pressure, wherein the piston 14, in dependence on the pressure difference acting on the piston 14 corresponding to the pressure difference between the drive mechanism space (indicated by reference numeral 17 in FIG. 3) and the suction side (indicated by reference numeral 18 in FIG. 3), reduces the effective valve opening between the drive mechanism space and the suction side to a greater or lesser degree, and in the extreme case closes it completely.

a. Examiner suggests breaking sentences like this one into several sentences for clarity. The specification is replete with this same problem. See pg. 4-5 paragraph/sentence bridging pages 4-5; pg. 5, second sentence of second full paragraph.

b. Minor Informalities – Example pg. 11 the disclosure of “to ensure that this is the also the case in any desired axial position.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are replete errors including:

- a. Unconventional claim language – examples include the use of possessive language – “its” and “within which”),
- b. Indefinite terms - an example of this is “especially [some further limiting feature,”

Art Unit: 3746

- c. Instances where antecedent basis for a limitation has not been provided – examples include: “one axially extending, especially slot shape, passageway,” “the first passageway,” “which passageway,” “the internal space,” and “its end faces.”
8. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because:
- a. **Lines 9-10** – The limitation “the pressure difference” lacks antecedent basis. The examiner notes that the is not the same limitation as the previously recited “a predetermined pressure difference” recited in line 7.
  - b. **Line 11** – The limitation “the free cross-section” lacks antecedent basis.
  - c. **Lines 11-12** – The limitation “the mass flow flowing” lacks antecedent basis.
  - d. **Line 10** - The limitation “the extreme case” lacks antecedent basis.
  - e. **Lines 8-11** – The limitations “the fluid connection between the drive mechanism chamber and the suction side is increasingly throttled as the pressure difference increases and is, in the extreme case, closed completely, in particular the free cross-section of the fluid connection being reduced in such a manner that the mass flow flowing out of the drive mechanism chamber” is replete with issues rendering the claim indefinite.
    - i. The limitation “in the extreme case” with reference to “the pressure difference” is indefinite because it is unclear whether the term means and extremely low pressure difference or an extremely high pressure

difference. The term introduces a range of conditions within a broader range conditions and renders the claim indefinite.

ii. The limitation “in particular the free cross-section of the fluid connection” is indefinite because it does not explicitly define what portion of a fluid connection is affected. The terms do not present a positive limitation that clearly defines the scope of the claim because it is unclear if the “free cross-section” of a fluid connection is required to be closed or some other (“particular”) portion of the fluid connection could also be affected and the claimed function would result. This is due to the use of the term “especially” which connotes that the function can occur with or without the claimed element that follows. This is particularly important when considering the limitations of claims that depend from claim 1. The issue is one of scope because it is unclear if the limitation that defined with “in particular” is present in each claim that depends from the claim 1. See MPEP 2173.05(d). Claims 2-15 are all dependent from claim 1, the scope of each claim is definite because it is unclear if the “particular free cross section of the fluid connection” of claim 1 is same in each claim.

iii. The limitation “in such a manner” is not a positive limitation and it is not clear what “manner” means in the scope of the claim.

iv. The limitation “mass flow flowing out of the drive mechanism” is indefinite because it unclear what fluid is being referred to, and where it is going.

Art Unit: 3746

9. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the limitation “their fluid connection” lacks antecedent basis.

10. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because:

- a. **Line 2** – The limitation “the throttling behavior” lacks antecedent basis.
- b. **Lines 2-3** – The limitation “increasing pressure difference” lacks antecedent basis.
- c. **Lines 2-4** – The limitation of “the throttling behavior . . . is linear, progressive, degressive and/or stepped” is indefinite because it unclear whether the “behavior” is one of functions listed, a combination of some but not all of the functions, or a combination of all of the functions.

11. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because:

- a. **Lines 2-3** – The limitation “a cylinder space, which has fluid connections” is indefinite because (1) “fluid connections” lacks antecedent basis and (2) it is unclear, although it is suggested by the use of “(lines 12, 13)” if this refers to the fluid connection line of claim 1.
- b. **Lines 2-4** – The limitation “a cylinder space, which has fluid connections . . . on the one hand . . . on the other hand” is indefinite because it is unclear if the limitations refer to a physical location within a cylinder space or a function characteristic. The issue is compounded by aspect that “on the other hand” is part of the limitation “on the other hand, and within which a piston is mounted.”

This suggests there is some physical relationship related to “on one hand,” “on the other hand,” and “cylinder space” but does not clearly define what physical relationship is.

c. **Lines 4-6** – The limitation “a piston is mounted so as to be displaceable back and forth especially in each case against the action of a resilient element” is indefinite because (1) the “resilient element” is not positively claimed rendering the scope of the claim unclear, (2) it is unclear if “in each case” relates to the movement of the piston, the “one hand” of the cylinder space, or the “other hand” of the cylinder space. With respect to (1) this issue raised by the limitation is whether or not there is a resilient member. This is due to the use of the term “especially” which connotes that the function can occur with or without the claimed element that follows. This is particularly important when considering the limitations of claims that depend from a claim that depends from a claim with such a term included. The issue is one of scope because it is unclear if the limitation that defined with “especially” is present in each claim that depends from the claim where it is recited. See MPEP 2173.05(d). Claims 5-9, 13, and 14 depend from claim 4, it is therefore unclear whether the scope of each claim must be considered to include “a resilient member.”

d. **Lines 7-8** – The limitation “the pressure difference acting on the piston” lacks antecedent basis.

e. **Line 9** – The limitation “the fluid passageway” lacks antecedent basis.

f. **Line 11** – The limitation “the extreme case” lacks antecedent basis.

Art Unit: 3746

g. **Lines 9-11** - The limitation “opens the fluid passageway between the drive mechanism chamber and the suction side to a greater or lesser extent, and in the extreme case closes completely” is indefinite because it is unclear (1) what passageway is being opened because “first passageway” is not positively related to “fluid connections” recited in the claims or “the fluid connection” of claim 1; (2) it unclear what would be considered an “extreme case” that would completely close the passageway.

12. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite because:

a. **Line 3** - The limitation “the wall” lacks antecedent basis.

b. **Line 3** – The limitation “one axially extending, especially slot shaped, passageway” is indefinite because it does not clearly define the scope of the element that is the subject of the clause(s). The limitation does not positively define a passageway to be either slot shaped or some other shape. See MPEP 2173.05(d). Claims 13 and 14 depend from claims 5 and it is unclear if the scope of those claims encompass an “especially slot shaped” passageway or would require that particular feature in order for the limitations of those claims to be enabled. One question is since the passageway is not required by claim 5 to be slot shaped, could the inventions of claims 13-15 be enabled if a passageway were not slot shaped. The other question is one of scope, do the inventions of claims 13 and 14 have slot shaped passageways or not?

Art Unit: 3746

- c. **Line 4** – The limitation “which passageway” lacks antecedent basis. The examiner recognizes that the limitation is followed by “(20)” which would relate back to the “one axially extending, especially slot shaped, passageway” but the examiner recognizes that it is common for applicants, in the case of a national stage application, to remove numerals previously recited in the international version of the application. In view of this practice the term “passageway” would be indefinite and could be confused with “fluid passageway” recited in claim 4, which claim 5 depends from.
- d. **Lines 4-5** – The limitation “a fluid connection line” is indefinite because it is unclear if this is the same as “a fluid connection line” recited in line 6 of claim 1.
- e. **Line 5** – The limitation “opens out latterly” is indefinite because it is unclear if the term describes a wall of the piston, the “passageway (20)”, or “a fluid connection line in communication with suction side.”
- f. **Line 6** - The term “whilst” is unconventional and confusing.
- g. **Line 6** – The limitation “the internal space” lacks antecedent basis.
- h. **Lines 6** – The term “its” is a possessive term that is not conventionally used in US practice and could cause confusion. In the instant case it is unclear whether “its” refers to an “internal space” of the piston specifically or the piston generally.
- i. **Line 7** – The limitation “open end face” lacks antecedent basis.

Art Unit: 3746

- j. **Line 7** – The limitation “a fluid connection line” because it is unclear if it is the same as “a fluid connection line” recited in line 6 of claim 1.
13. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite because:
- a. **Line 2** – The limitation “the closed face” lacks antecedent basis.
  - b. **Line 3** – The limitation “its piston base” lacks antecedent basis and includes a term “its” that is not conventionally used claiming an invention.
  - c. **Line 3** – The limitation “or, that is to say, its piston base (23)” is indefinite because it fails to recite a positive limitation that defines the scope of a piston or element that interacts with a suction side. The essential inquiry raised by the limitation is whether there is, or is not, a piston base. See MPEP 2173.05(d).
14. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite because:
- a. **Line 3** – The limitation “especially helical compression springs” is not a positive limitation and renders the scope of the claim indefinite. The issue raised is whether the springs are in fact helical. See MPEP 2173.05(d).
  - b. **Line 4** – The term “its” is unconventional claiming terminology that could be confusing.
  - c. **Line 4** – The limitation “end faces” lacks antecedent basis.
15. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite because the limitation “the spring elements” lacks antecedent basis.

Art Unit: 3746

16. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite because

- a. **Line 3** – The limitations “the first passageway” lacks an antecedent basis.
- b. **Lines 3-4** – The limitation “delivery (high-pressure) side” lacks an antecedent basis. The limitation of “delivery side,” previous to claim 9, was not recited as on a high or low pressure “side” of the instant invention. Further, the use of parentheses in a claim is not a conventional technique and renders the claim indefinite because it is unclear if a “delivery side” is on a high pressure side for each of the previous recitations of the term or is only on a high pressure side when the conditions in claim 9 are met.

17. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite because the limitation “especially in its piston” is not a positive limitation that clearly defines the scope of the claim. See MPEP 2173.05(d). The issue is whether the piston of claim 10 does or does not include means for separating out “lubricants, particles or the like.”

18. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the scope of the limitation “made from steel, steel alloy, light metal, especially aluminum, and/or plastics material” is unclear. One of ordinary skill would not know whether the piston was made of one, a combination of some but not all, or a combination of all of the types of materials claimed. Further, it is also unclear that if a piston made from a combination that includes a light metal and plastic or steel, if the light metal must or must not be aluminum.

Art Unit: 3746

19. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for its dependency on claim 11.

a. As discussed above the limitations of claim 11 set forth, although not definitively, a piston made of a combination of materials including plastic or just plastic. This renders the scope of claim 12 is unclear because it is unclear whether the limitations of claim 12 apply to only a piston that is entirely made of plastic or also applicable to a piston made of plastic and a combination of other materials in claim 11, and if a combination of materials, which materials would be included.

b. The limitations of “the end faces” in line 3 of the claim lack antecedent basis. It appears that in order for claim 12 to be proper where there is antecedent basis for each limitation, claim 11 would have to depend from claim 7 and claim 12 would remain to depend from claim 11.

20. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because:

a. **Line 2** – The limitation “the passageway,” when taking into account that reference numerals in the claims will be removed, lacks antecedent basis.

b. **Lines 3** – The limitation “an inward bulge, especially an annular inward bulge” is indefinite because it fails to positively define the scope of “an inward bulge.” See MPEP 2173.05(d). The inquiry the limitation raises, is whether the inward bulge has to be and is annular, or some other configuration.

- c. **Line 4** – The limitation, “the fluid line,” taking into account that reference numerals in the claims will be removed, is not clearly distinguished to refer to either recitation of “a fluid line” in claim 5, from which claim 13 depends.
  - d. **Line 5-6** – The limitation “an outward bulge, especially an annular outward bulge or groove” is indefinite because it fails to positively define the scope of “an inward bulge.” See MPEP 2173.05(d). The inquiry the limitation raises, is whether the outward bulge has to be and is annular or a groove, or some other configuration.
  - e. **Line 6-7** – The limitation “the function of the regulating valve” lacks antecedent basis and fails to define the scope of operation claimed. Claim 13 depends from claim 1 and intervening claims 4 and 5. Several functions, related the regulating generally and to the elements claimed as part of the regulating valve specifically, are set forth in claims 1, 4, and 5. A recitation of “the function of the regulating” fails to clearly associate any of the previously claimed functions or sub-functions to other limitations of claim 13.
  - f. **Line 7** – The limitation “the event” lacks antecedent basis.
21. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because:
- a. **Line 2** - The limitation “the outside of the piston wall” lacks antecedent basis.
  - b. **Lines 2-3** – The limitation “the cylinder wall” lacks antecedent basis.

Art Unit: 3746

c. **Lines 4-5** – The limitation “that part of the cylinder” lacks antecedent basis.

d. **Line 5** – The limitation “the piston base” lacks antecedent basis.

22. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because:

a. **Line 2** - The limitation “the slot shaped passageway” lacks antecedent basis.

b. **Lines 2** – The limitation “the wall” lacks antecedent basis.

c. **Lines 3-4** – The limitation “becomes wider or narrower either continuously or stepped in one direction axially” is indefinite because it is unclear whether the operating characteristics of “continuously or stepped” apply to the conditions of becoming “wider or narrower” respectively or with both conditions.

d. **Line 4** – The limitation “the desired regulation behaviour” lacks antecedent basis. In addition “behaviour” should be --- behavior ---.

e. **Line 5** – The limitation “especially becoming narrower” renders the scope of the claim indefinite because it fails to recite a positive limitation. See MPEP 3173.05(d).

f. **Lines 5-6** – The limitation “the drive mechanism side” lacks antecedent basis.

g. **Line 6** – The limitation “the mass flow flowing” lacks antecedent basis.

h. **Line 6** – The limitation “the drive mechanism space” lacks antecedent basis.

***Claim Rejections - 35 USC § 102***

23. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

24. Claims 1-6, 9-10 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Kenj JP 03-009087 (“Kenji”).

Kenji teaches the limitations for a compressor including:

**[claim 1]** an axial piston compressor (1, 6) having a housing (1, 2, 6) delimiting a drive mechanism chamber 8, having a cylinder block 1 in which at least one piston 11 is mounted so as to be axially displaceable back and forth, and having a cylinder head 2 having a suction side 4 and a delivery side 5, there being provided between the drive mechanism chamber 7 and the suction side 4 a fluid connection (28, 30) in which there is arranged a regulating valve (fig. 2, elements 30-38; “30”) by means of which, starting from a predetermined pressure difference between the drive mechanism chamber 7 and the suction side 4, the fluid connection (28, 30) between the drive mechanism chamber 7 and the suction side 4 is increasingly throttled (Kenji, English Abstract – Constitution (“Abstract”)), as provided by applicant) as the pressure difference further increases and is, in the extreme case, closed completely (Kenji- Abstract), in particular the free cross-section (as defined by one of elements 31 and 32) of the fluid connection (28, 30) being reduced in such a manner that the mass flow flowing out of the drive mechanism chamber 7 is maintained approximately at a constant low level (Kenji – Abstract);

Art Unit: 3746

**[claim 2]** characterized in that, in the event of a predetermined higher pressure difference between the drive mechanism chamber 7 and the suction side 4, the regulating valve 30 reopens their fluid connection so that a predetermined lower pressure difference can be established (Kenji,—Abstract ("the opening and closing of the control valve 30 are so controlled as to open when pressure in the crank chamber 7 is equal to or below the first predetermined value, to throttle when the aforesaid pressure is above the first predetermined valve, but equal to or less than the second predetermined value, and again to open when the pressure is above the second predetermined value.")).

**[claim 3]** characterized in that the throttling behavior of the regulating valve 30 (Kenji, Abstract) with increasing pressure difference between the drive mechanism chamber 7 and the suction side 4 is linear, progressive, degressive and/or stepped (Kenji discloses a linear profile for the pressure in the crank in figure 6 with pressure  $P_{c1}$ );

**[claim 4]** characterized in that the regulating valve 30 comprises a cylinder space 29, which has fluid connections (28, 31, 32) with the drive mechanism chamber 7, on the one hand, and with the suction side 4, on the other hand, and within which a piston 33 is mounted so as to be displaceable back and forth especially in each case against the action of a resilient element 37, wherein the piston 33, in dependence on the pressure difference acting on the piston 33 corresponding to the pressure difference between the drive mechanism chamber 7 and the suction side 4 (see figure 1, line 28 is connected to the suction chamber 4 and during a substantial portion of the piston 33 movement, the suction pressure is applied to at least the right side of the piston 33 through passage 32;

Art Unit: 3746

the other side of the piston is always communicating with the crank chamber 7 so pressure from the crank chamber 7 is always applied to the left side for the piston 33), opens the fluid passageway (28, 30) between the drive mechanism chamber 7 and the suction side 4 to a greater or lesser extent, and in the extreme case closes it completely (Kenji, Abstract);

**[claim 5]** the piston 33 of the regulating valve 30 is a hollow piston 33 (passage 35 extends from the end of piston 33 past a midpoint of the piston; effectively making the largest section of the piston hollow) open at one end face (end of the element 33 in communication with crank chamber 7; "33/7"), in the wall (wall defined by inner wall surface of element 29 extending along a longitudinal axis; "29-wall") of which there is formed at least one axially extending, especially slot-shaped, passageway 35, with which passageway 35 there is associated the suction side or a fluid line 28 in communication with the suction side 4 and opening out laterally into the cylinder space (via either element 31 or 32), whilst the internal space (hollow space defined by element 35) of the piston 33 has, by way of its open end face (33/7), a fluid connection (line between crank chamber 7 and the bore 29 that accommodates piston 33; "7/29") with the drive mechanism chamber 7;

**[claim 6]** characterized in that the suction side 4 is also applied to the closed end face of the piston (right side of piston 33 ("33-rt") via port defined by element 32) or, that is to say, its piston base (33-rt);

**[claim 9]** characterized in that the wall (29-wall) of the piston 33 has a second passageway 32 which is spaced axially away from the first passageway 31 in the

Art Unit: 3746

direction of the delivery side 5 and which comes into effect after a predetermined higher pressure difference between the drive mechanism chamber 7 and the suction side 4 has been exceeded and opens or frees the fluid connection 28 between the drive mechanism chamber 7 and the suction side 4 for reducing the higher pressure difference (Kenji, Abstract);

**[claim 10]** characterized in that in the flow path (28, 30) of the regulating valve 33, especially in its piston, there are arranged means (36) for separating out lubricant particles.

The applicant has claimed a "means for separating out lubricant" and properly invoked 35 U.S.C. 112, sixth paragraph, because the "means" is modified by the function of "separating" and not modified by significant structure. MPEP 2181. The instant application discloses that at least one axial or longitudinal groove on the outside of the piston 14 retains oil from the coolant in the compressor. US App. 10/592978, pg. 11 third full paragraph bridging page 11 and 12. The piston taught by Kenji includes an axial groove 36 that could according to the instant application serve the purpose of separating oil from the fluid the valve 30 permits to flow to the suction chamber 4.

**[claim 13]** characterized in that the passageway (34 and 31 or 32) associated with the suction side 4 is located in the wall 34 of the piston 33 within an inward bulge 34, especially an annular inward bulge 34, and/or the opening of the fluid line 28 opening laterally into the cylinder space 28 and in communication with the suction side 4 is located within an outward bulge (one of elements 31 or 32), especially an annular outward bulge (31 or 32) or annular groove (31 or 32) so that the function of the

Art Unit: 3746

regulating valve 30 is maintained even in the event of rotation of the piston 33 about its longitudinal axis;

**[claim 14]** characterized in that on the outside of the piston wall 36 and/or on the cylinder wall delimiting the cylinder space there are formed one or more longitudinal grooves 36, by means of which a fluid connection between the suction side 4 and that part of the cylinder space 29 which is located beneath the piston base (33-rt) is maintained (when the piston 33 shown in figure 2 moves to the right just enough that o-ring 38 does not block the groove 38 then the passage from the crank will communicate with fluid line 28 through axial groove 36, annular grooves 34 and 31, and the branch line from line 28 that connects to groove 31; this effectively allows the pressure from the crank chamber to be applied to, or is at least in communication with, the right side of the piston 33 because of the communication of the branch line that connects to annular groove 32 and the branch line that connects to annular groove 31 at the junction where fluid 28 branches into the two lines); and

**[claim 15]** characterized in that the slot-shaped passageway (34 and one of elements 31 and 32) in the wall (33-wall) of the piston 33 of the regulating valve 30 becomes wider or narrower either continuously or stepped in one direction axially (when the piston 33 of valve 30 moves to the right the annular groove 34 is closed by the side wall of the cylinder chamber 29 until it is aligned with annular groove 32), in dependence on the desired regulation behavior, especially becoming narrower either continuously (in the motion to the right the piston 33 moves towards the discharge chamber which defines a delivery side of the compressor) or stepped towards the drive mechanism

Art Unit: 3746

delivery side 5, so that the mass flow flowing out of the drive mechanism space 5 remains substantially constant.

***Claim Rejections - 35 USC § 103***

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. Claims 11 and 12 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenji, as applied to claim 1, as evidenced by Endo US 2003/0118456 ("Endo"). Kenji teaches all the limitations as discussed above, and including **[claim 12]** a spring embedded in a piston, but is silent as to **[claim 11]** the material that the valve 30 is made from. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Endo teaches that it was known in the art to provide valve components in a control valve that controls a fluid connection between the suction chamber and crank chamber of a variable displacement compressor with a rubber or plastic part. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the valve components for variable displacement control valve made from, since the modification is considered routine in the art and the prior art of Endo teaches it was known to provide parts of a similar valve made from plastic. Endo, ¶[0024].

***Allowable Subject Matter***

27. Claims 7-8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, and in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are cited on form 892 herewith.

|                                   |  |
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| Ota et al.<br><br>US 2004/0258536 | Teaches a control valve for a variable displacement compressor that restricts or permits fluid communication between a crank chamber and suction chamber similar to the instant invention. |
|-----------------------------------|--|

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD WEINSTEIN whose telephone number is (571)272-9961. The examiner can normally be reached on Monday - Thursday 7:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3746

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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